

LISTING OF THE CLAIMS:

Claim 1 (Currently Amended): Process for the production of a mixture comprising hydrogen and CO, ~~of the type according to which partial oxidation of~~ comprising partially oxidizing a hydrocarbon by an oxygenated medium or a medium capable of releasing oxygen, ~~wherein the process is carried out, and according to which the processing~~ is carried out under autothermal conditions, the heat given off by said oxidation being recovered to maintain the endothermic reactions which take place between ~~the a~~ nonoxidized fraction of said hydrocarbon and ~~the~~ CO₂ and ~~the~~ steam produced by said oxidation, characterized in that: wherein

BB the reaction gas mixture comprising the hydrocarbon and the oxygenated medium is passed through introduced into a porous medium which has been preheated beforehand, thus making it possible to heat and wherein

the introduction of the reaction gas mixture into the porous medium results in heating the reaction gas mixture by heat exchange with the porous medium to a temperature threshold sufficient to initiate a combustion reaction reactions, rendering unnecessary an external heat supply when operating continuously.

Claim 2 (Currently Amended): Process according to Claim 1, characterized in that wherein said preheated porous medium is formed by a first inert porous material and in that wherein the reaction gas mixture or a product thereof successively encounters said first inert porous material, a catalytic bed (5) and then a second inert porous material (6).

Claim 3 (Currently Amended): Process according to Claim 2, ~~characterized in that~~
wherein said first and second inert porous ~~material~~ materials are identical.

Claim 4 (Currently Amended): Process according to Claim 2, ~~characterized in that~~
wherein said reaction gas mixture or a product thereof successively encounters said first inert porous material, said catalytic bed and said second inert porous material within a vertical cylindrical reactor, the ends of which are filled with one or other of said inert porous materials and the central part of which is filled with said catalytic bed, and ~~in that~~ wherein the reactor is alternately fed in alternate mode in by the following way introduction modes (i) and (ii):

i) the reaction gas mixture is introduced ~~in the~~ to a lower part of the reactor and the mixture comprising the hydrogen and the CO is collected at ~~the~~ an upper part of the reactor, or

ii) the reaction gas mixture is introduced ~~in~~ to the upper part of the reactor and the mixture comprising the hydrogen and the CO is collected at the lower part of the reactor,
~~passing from one of~~ wherein the introduction modes (i) and (ii) ((i) (ii)) ~~to the~~
other alternate as a function of the advance of ~~the~~ a combustion front inside the reactor.

Claim 5 (Currently Amended): Process according to Claim 1, ~~characterized in that~~
wherein the preheating of said porous medium is carried out using electrical elements situated at the periphery of the reactor.

Claim 6 (Currently Amended): Process according to Claim 1, ~~characterized in that~~
wherein the preheating of said porous medium is carried out by circulating therein, prior to said introduction of the reaction mixture, a preheating gas mixture comprising a hydrocarbon and oxygen in proportions which make possible for achieving total combustion.

Claim 7 (Currently Amended): Process according to Claim 2, ~~characterized in that~~
wherein said reaction gas mixture or a product thereof successively encounters said first inert porous material, said catalytic bed and said second inert porous material within a reactor exhibiting comprising the following arrangement:

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- a first cylinder comprising, at its lower end, means for introducing said reaction gas mixture;
- a second cylinder of smaller diameter than said first cylinder, inserted into said first cylinder so that its upper end is situated at a distance from the upper end of the first cylinder and so that its lower end, via which the mixture comprising the hydrogen and the CO is collected, emerges outside the first cylinder;
- said first inert porous material filling at least a portion of the height of the annular space defined by the internal wall of the first cylinder and the external wall of the second cylinder;
- said catalytic bed filling the upper part of the first cylinder and/or that of the second cylinder;
- said second inert porous material filling the lower part of the second cylinder.

Claim 8 (Currently Amended): Process according to Claim 7, ~~characterized in that~~
wherein the preheating of said porous medium is carried out using electrical elements situated
at the periphery of the reactor.

Claim 9 (Currently Amended): Process according to Claim 7, ~~characterized in that~~
wherein the preheating of said porous medium is carried out by circulating therein, prior to said
introduction of the reaction mixture, a preheating gas mixture comprising a hydrocarbon and
oxygen in proportions ~~which make possible~~ for achieving total combustion.

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Claim 10 (Currently Amended): Process according to Claim 3, ~~characterized in that~~
wherein said reaction gas mixture or a product thereof successively encounters said first inert
porous material, said catalytic bed and said second inert porous material within a vertical
cylindrical reactor, the ends of which are filled with one or other of said inert porous materials
and the central part of which is filled with said catalytic bed, and ~~in that~~ wherein the reactor is
alternately fed in alternate mode in by the following way introduction modes (i) and (ii):

i) the reaction gas mixture is introduced ~~in the~~ to a lower part of the reactor and

the mixture comprising the hydrogen and the CO is collected at ~~the~~ an upper part of the reactor,
or

ii) the reaction gas mixture is introduced ~~in~~ to the upper part of the reactor and the
mixture comprising the hydrogen and the CO is collected at the lower part of the reactor,

~~passing from one of~~ wherein the introduction modes (i) and (ii) ((i)-(ii)) to the
other alternate as a function of the advance of ~~the~~ a combustion front inside the reactor.

Claim 11 (Currently Amended): Process according to Claim 2, ~~characterized in that~~
wherein the preheating of said porous medium is carried out using electrical elements situated
at the periphery of the reactor.

Claim 12 (Currently Amended): Process according to Claim 3, ~~characterized in that~~
wherein the preheating of said porous medium is carried out using electrical elements situated
at the periphery of the reactor.

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Claim 13 (Currently Amended): Process according to Claim 2, ~~characterized in that~~
wherein the preheating of said porous medium is carried out by circulating therein, prior to said
introduction of the reaction mixture, a preheating gas mixture comprising a hydrocarbon and
oxygen in proportions which make possible for achieving total combustion.

Claim 14 (Currently Amended): Process according to Claim 3, ~~characterized in that~~
wherein the preheating of said porous medium is carried out by circulating therein, prior to said
introduction of the reaction mixture, a preheating gas mixture comprising a hydrocarbon and
oxygen in proportions which make possible for achieving total combustion.

Claim 15 (Currently Amended): Process according to Claim 3, ~~characterized in that~~
wherein said reaction gas mixture or a product thereof successively encounters said first inert
porous material, said catalytic bed and said second inert porous material within a reactor
exhibiting comprising the following arrangement:

- a first cylinder comprising, at its lower end, means for introducing said reaction gas mixture;

- a second cylinder of smaller diameter than said first cylinder, inserted into said first cylinder so that its upper end is situated at a distance from the upper end of the first cylinder and so that its lower end, via which the mixture comprising the hydrogen and the CO is collected, emerges outside the first cylinder;

- said first inert porous material filling at least a portion of the height of the annular space defined by the internal wall of the first cylinder and the external wall of the second cylinder;

- said catalytic bed filling the upper part of the first cylinder and/or that of the second cylinder;

- said second inert porous material filling the lower part of the second cylinder.

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Claim 16 (Currently Amended): Process according to Claim 15, characterized in that wherein the preheating of said porous medium is carried out using electrical elements situated at the periphery of the reactor.

Claim 17 (Currently Amended): Process according to Claim 15, characterized in that wherein the preheating of said porous medium is carried out by circulating therein, prior to said introduction of the reaction mixture, a preheating gas mixture comprising a hydrocarbon and oxygen in proportions which make possible for achieving total combustion.

Claim 18 (New): Process according to claim 1, wherein during continuous operation of the process, the porous medium is not heated by an external heat supply.


Claim 19 (New): Process according to claim 1, wherein the entire flow of the reaction gas mixture is introduced into the porous medium.
